

IN THE CLAIMS:

Please amend claims 1, 13, 24 and 28 as set forth below, and please cancel claims 7, 10-12, 18-23 and 27 without prejudice or disclaimer of the subject matter thereof.

1. (currently amended) A screen for allowing a light generated by a light source and modulated by a picture display device having pixels laid out to form a matrix to produce an image thereon to be projected by using a projection optical means on said screen as an enlarged picture, said screen comprising:

a Fresnel lens sheet forming Fresnel lenses at an emission side of said light;

a first configuration element having:

a plurality of lenticular lenses at an incidence side of light emitted from said Fresnel lens sheet;

light passing windows formed at a light emission side of said first configuration element and each provided at a place in close proximity to each focal point of said lenticular lenses;

a plurality of light absorbing layers each provided among said light passing windows; and

a second configuration element placed on said emission side of said first configuration element;

wherein a pitch of said ~~light passing windows~~ absorbing layers formed on said first configuration element is made smaller than a pitch in a horizontal direction of pixels projected and enlarged on said screen from said image produced by said picture display device, and a pitch in a vertical direction of the pixels projected and enlarged on said screen from said image produced by said picture display device is at least twice of a pitch of said Fresnel lenses formed on said Fresnel lens sheet;

wherein said second configuration element is adhered to said first configuration element so as to eliminate an air boundary surface therebetween; and
wherein a reflection preventing film is ~~bound~~provided at an observation-side surface of said second configuration element.

2. (previously amended) A screen according to claim 1 wherein an emission surface of a light passing plate provided on said second configuration element is subjected to a reflection preventing process for preventing reflection of a visible light.

3. (previously amended) A screen according to claim 1 wherein, on an emission side of a light passing plate provided on said second configuration element, there is provided a reflection preventing film for preventing reflection of a visible light.

4. (previously amended) A screen according to claim 2 wherein a light scattering material is mixed inside said light passing plate.

5. (previously amended) A screen according to claim 2 wherein a light scattering layer is provided between said light passing plate and said first configuration element.

6. (previously amended) A screen according to claim 1 wherein:
said Fresnel lenses of said Fresnel lens sheet are laid out at a pitch F_p ;
said light passing windows are laid out in a horizontal direction of said screen at a pitch L_p ; and

a ratio L_p/F_p of said pitch L_p to said pitch F_p is set at a value in the range 1.588 to 1.649.

7. (canceled) A screen for projecting an enlarged picture on said screen from a picture display apparatus including a light source, a picture display device implemented as a matrix of pixels each having a means for modulating the intensity of a light generated by said light source, and a projection optical means for projecting said displayed picture appearing on said picture display device,

said screen comprising:

a first configuration element having a plurality of lenticular lenses provided on a light-emission side of said picture display device and light absorbing layers provided on a light-emission side of said lenticular lenses; and

a light passing second configuration element provided on said light-emission side of said first configuration element;

said lenticular lenses having a longitudinal direction coinciding with a screen surface vertical direction and laid out contiguously in a screen surface horizontal direction; and

said light absorbing layers sandwiched by boundaries of any two adjacent openings each provided at a location in close proximity to a focal point of one of said lenticular lenses associated with said opening;

wherein:

said first and second configuration elements are bound or stuck to each other so as to eliminate an air boundary surface therebetween;

a pitch of said openings is made smaller than a pitch of pixels projected and enlarged on said screen from said displayed picture output by said picture display device; and

a pitch of interference lines caused by interference between a pitch of an opening of said lenticular lenses and a pitch in the horizontal direction of pixels projected and enlarged on said screen from said image produced by said picture display device is set at a value equal to or smaller than said pitch of pixels projected and enlarged on said screen from said displayed picture output by said picture display device.

10. (canceled) A screen according to claim 7 wherein a light scattering material is mixed inside said second configuration element.

11. (canceled) A screen according to claim 7 wherein a light scattering layer is provided between said second configuration element and said first configuration element.

12. (canceled) A screen according to claim 7 wherein a third configuration element having Fresnel lenses is provided on a light-incidence side of said first configuration element;

said Fresnel lenses of said third configuration element laid out at a lens pitch F_p ;

said openings of said first configuration element are laid in a horizontal direction of said screen at a pitch L_p ;

a ratio L_p/F_p of said lens pitch L_p to said pitch F_p is at a value in the range 1.588 to 1.649; and

a pitch M_{pl} of moire lines is set at a value smaller than a pitch l_{ph} of pixels projected and enlarged on said screen in a screen horizontal direction from said displayed picture output by said picture display device.

13. (currently amended) A projection-type picture display apparatus comprising:

a light source;

a picture display device implemented as a matrix of pixels for modulating the intensity of a light generated by said light source; and

a projection optical means for projecting a picture appearing on said picture display device, a Fresnel lens sheet having Fresnel lenses formed thereon and placed on an emission side of said picture display device;

a first configuration element having:

lenticular lenses provided on an incidence side of a light passing through said Fresnel lens sheet; and

light absorbing layers each provided at a place in close proximity to the focal point of one of said lenticular lenses and are separated from each other by a predetermined distance for forming a light passing window;

a second configuration element having a light passing plate fixed on said emission side of said first configuration element;

wherein a pitch of said light ~~passing windows~~ absorbing layers is made smaller than a pitch in a horizontal direction of pixels projected and enlarged on a screen from an image produced by said picture display device; and

wherein a pitch in a vertical direction of the pixels projected and enlarged on said screen from said image produced by said picture display device is at least twice of a pitch of said Fresnel lenses formed on said Fresnel lens sheets; and

wherein said second configuration element is adhered to said first configuration element so as to eliminate an air boundary surface therebetween.

14. (original) A projection-type picture display apparatus according to claim 13 wherein, on an emission side of said light passing plate, there is provided a reflection preventing film for preventing reflection of a visible light.

15. (original) A projection-type picture display apparatus according to claim 13 wherein a light scattering material is mixed inside said light passing plate.

16. (original) A projection-type picture display apparatus according to claim 13 wherein a light scattering layer is provided between said light passing plate and said first configuration element.

17. (previously amended) A projection-type picture display apparatus according to claim 13 wherein:

Fresnel lenses of said Fresnel lens sheet are laid out at a pitch F_p ;

said light passing windows are laid out in a horizontal direction of said screen at a pitch L_p ; and

a ratio L_p/F_p of said pitch L_p to said pitch F_p is set at a value in the range 1.588 to 1.649.

18. (canceled) A projection-type picture display apparatus comprising:

a light source;

a picture display device implemented as a matrix of pixels each having a means for modulating the intensity of a light generated by said light source;

a projection optical means for projecting a displayed image appearing on said picture display device; and

a screen used by said projection optical means to project said displayed image as an enlarge picture and provided with:

a first configuration element having a plurality of lenticular lenses provided on a light-emission side of said picture display device and light absorbing layers provided on a light-emission side of said lenticular lenses, and

a light passing second configuration element provided on said light-emission side of said first configuration element,

said lenticular lenses having a longitudinal direction coinciding with a screen surface vertical direction and laid out contiguously in a screen surface horizontal direction;

said light absorbing layers sandwiched by boundaries of any two adjacent openings each provided at a location in close proximity to a focal point of one of said lenticular lenses associated with said opening; and

said first and second configuration elements are bound or stuck to each other so as to eliminate an air boundary surface therebetween;

wherein a pitch of said openings is made smaller than a pitch of pixels projected and enlarged on said screen from said displayed image output by said picture display device; and

a pitch of interference lines caused by interference between a pitch of an opening of said lenticular lenses and a pitch in the horizontal direction of pixels

projected and enlarged on said screen from said image produced by said picture display device is set at a value equal to or smaller than said pitch of pixels projected and enlarged on said screen from said displayed image output by said picture display device.

19. (canceled) A projection-type picture display apparatus according to claim 18 wherein an emission surface of said second configuration element is subjected to a reflection preventing process for preventing reflection of a visible light.

20. (canceled) A projection-type picture display apparatus according to claim 18 wherein a light scattering material is mixed inside said second configuration element.

21. (canceled) A projection-type picture display apparatus according to claim 18 wherein a light scattering layer is provided between said second configuration element and said first configuration element.

22. (canceled) A projection-type picture display apparatus according to claim 18 wherein:

a third configuration element having Fresnel lenses is provided on a light-incidence side of said first configuration element;

said Fresnel lenses of said third configuration element are laid out at a lens pitch F_p ;

said openings of said first configuration element are laid out in a horizontal direction of said screen at a pitch L_p ;

a ratio L_p/F_p of said lens pitch L_p to said pitch F_p is set at a value in the range 1.588 to 1.649; and

a pitch M_{pl} of moire lines is set at a value smaller than a pitch I_{ph} of pixels projected and enlarged on said screen in a screen horizontal direction from said displayed image output by said picture display device.

23. (canceled) A screen comprising:

a Fresnel lens sheet;

a first configuration element having:

lenticular lenses provided on an incidence side of a light passing through said Fresnel lens sheet; and

light absorbing layers each provided at a place in close proximity to the focal point of one of said lenticular lenses and are separated from each other by a predetermined distance for forming a light passing window; and

a second configuration element having a light passing plate fixed on said emission side of said first configuration element;

wherein a pitch of said light passing windows is made smaller than a pitch of pixels projected and enlarged on said screen from said image produced by said picture display device; and

wherein said second configuration element is adhered to said first configuration element so as to eliminate an air boundary surface therebetween.

24. (currently amended) A screen for projecting an enlarged picture on said screen from a picture display apparatus comprising:

a Fresnel lens sheet having Fresnel lenses formed thereon at a light-emission side of said picture display apparatus;

a first configuration element having a plurality of lenticular lenses provided on a said light-emission side of said picture display ~~device~~ apparatus and light absorbing layers provided on a light-emission side of said lenticular lenses, and

a light passing second configuration element provided on said light-emission side of said first configuration element, said lenticular lenses having a longitudinal direction coinciding with a screen surface vertical direction and laid out contiguously in a screen surface horizontal direction; and

said light absorbing layers sandwiched by boundaries of any two adjacent openings each provided at a location in close proximity to a focal point of one of said lenticular lenses associated with said opening;

wherein said first and second configuration elements are ~~bound or stuck~~ bonded or adhered to each other so as to eliminate an air interface therebetween;

a pitch of said openings is made smaller than a pitch of pixels projected and enlarged on said screen from said displayed picture output produced by said picture display ~~device~~ apparatus; and

a pitch of interference lines caused by interference between a pitch of an opening of said lenticular lenses and a pitch in the horizontal direction of pixels projected and enlarged on said screen from said ~~image-displayed picture output~~ produced by said picture display ~~device~~ apparatus is set at a value equal to or smaller than said pitch of pixels projected and enlarged on said screen from said displayed picture output produced by said picture display ~~device~~ apparatus; and

a pitch in a vertical direction of the pixels projected and enlarged on said screen from displayed picture output produced by said picture display apparatus is at least twice of a pitch of said Fresnel lenses formed on said Fresnel lens sheet.

25. (original) A screen according to claim 1, wherein:

a pitch of said lenticular lenses formed on said first configuration element is L_p ;

a pitch of said Fresnel lens formed on said Fresnel lens sheet is F_p ;

a ratio of L_p/F_p of said pitch L_p to said pitch F_p is set at a value in the range of 1.588 to 1.649;

a pitch M_{p1} of moire lines caused by said pitch L_p of said lenticular lenses and said pitch F_p of said Fresnel lens and a horizontal component l_{ph} of a pitch l_p of said pixels enlarged and projected on said screen are substantially equal; and

a ratio l_{pv}/F_p of a vertical component l_{pv} of said pitch l_p of said pixels enlarged and projected on said screen to said pitch F_p of said Fresnel lens is set to at least 2.

26. (original) A screen according to claim 1, wherein said plurality of lenticular lenses of said first configuration element extend in a vertical direction and are arranged in a horizontal direction at the incident side of light emitted from said Fresnel lens sheet.

27. (canceled) A screen according to claim 1, wherein a reflectance of said reflection preventing film does not exceed 1% in the visible wavelength region.

28. (currently amended) A screen for allowing a light generated by a light source and modulated by a picture display device having pixels laid out to form a matrix to produce an image thereon to be projected by using a projection optical means lens on said screen as an enlarged picture, said screen comprising:

a Fresnel lens sheet formed of Fresnel lenses at an emission side of said light;

a first configuration element having:

a plurality of lenticular lenses extended to a vertical direction and arranged in a horizontal direction at an incidence side of light emitted from said Fresnel lens;

light passing windows formed at a light emission side of said first configuration element and each provided at a place in close proximity to each focal point of said lenticular lenses;

a plurality of light absorbing layers each provided among said light passing windows; and

a second configuration element placed on said emission side of said first configuration element;

wherein a pitch of said light ~~passing windows~~ absorbing layers formed on said first configuration element is made smaller than a pitch in a horizontal direction of the pixels projected and enlarged on said screen from said image produced by said picture display device, and a pitch in a vertical direction of the pixels projected and enlarged on said screen from said image produced by said picture display device is at least twice of a pitch of said Fresnel lenses formed on said Fresnel lens sheet.